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**United States Patent** [19]

Lanter et al.

[11] **Patent Number:** **5,683,739**[45] **Date of Patent:** **Nov. 4, 1997**[54] **EXTRUDED ANIMAL FEED NUGGETS FOR RUMINANTS**[75] Inventors: **Kent J. Lanter**, Waterloo, Ill.; **David C. Weakley**, Eureka, Mo.[73] Assignee: **Purina Mills, Inc.**, St. Louis, Mo.[21] Appl. No.: **680,710**[22] Filed: **Jul. 11, 1996****Related U.S. Application Data**

[62] Division of Ser. No. 421,234, Apr. 13, 1995, Pat. No. 5,540,932.

[51] **Int. Cl.<sup>6</sup>** ..... **A23K 1/18; A23K 1/16**[52] **U.S. Cl.** ..... **426/623; 426/656; 426/608; 426/516; 426/807; 424/438; 424/442**[58] **Field of Search** ..... **426/623, 656, 426/608, 516, 807; 424/438, 442**[56] **References Cited****U.S. PATENT DOCUMENTS**

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Hard, stable, extruded animal feed nuggets are prepared for ruminants, the nuggets comprising between about 90 to 99 wt % of at least one protein-containing ingredient and between about 1.0 to 6.0 wt % of added fat. Preferably, the animal feed nugget is also comprised of between about 0.02 and 5.0 wt % of sulfur. The animal feed nugget of this invention is prepared by a method comprising the steps of:

A. plasticizing a blend of at least one protein-containing ingredient, added fat, sulfur, if present, and water in an extruder,

B. extruding the plasticized blend to form an animal feed nugget, and

C. drying the extruded nugget to a water content of less than about 12 wt %, based on the total weight of the nugget.

Animal feed nuggets prepared by this method function as a rumen escape composition in that they permit the release of beneficial nutrients in the abomasum or subsequent digestive tract. Thus, when this nugget is fed as part of a lower crude protein diet, the ruminants can actually achieve the same level of milk and milk component yield as those ruminants fed a normal crude protein diet.

**6 Claims, No Drawings**